



JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **09082257 A**(43) Date of publication of application: **28 . 03 . 97**

(51) Int. Cl.

**H01J 37/21
G01R 31/302
H01J 37/153**(21) Application number: **07237456**(22) Date of filing: **14 . 09 . 95**(71) Applicant: **TOSHIBA CORP TOPCON CORP**(72) Inventor:
**OGASAWARA MUNEHIRO
TAMAMUSHI SHUICHI
ONOGUCHI KAZUNORI
WAKAMORI HIDEO****(54) ASTIGMATISM CORRECTION AND FOCUSING
METHOD FOR CHARGED PARTICLE OPTICAL
TUBE**

can be made, regardless of the surface shape of a sample.

COPYRIGHT: (C)1997,JPO

(57) Abstract:

PROBLEM TO BE SOLVED: To make a highly accurate correction for astigmatism by obtaining Fourier transformation images via the focal distances of a lens at different set values, and making the correction on the basis of the cross sectional forms of beams identified through the different focal distances.

SOLUTION: Secondary particle signals are extracted through an objective lens at two different focal distances and, thereafter, two-dimensional Fourier transformation values $I(kx, ky)$ and $I'(kx, ky)$ are obtained for each focal distance. Thereafter, the value of $R(kx, ky)$ determined by a relationship of differences of the magnitude of each of absolute values $|I(kx, ky)|$ and $|I'(kx, ky)|$ is obtained. The direction of astigmatism is, then, obtained from the value of α , provided that the component of the value of $R(kx, ky)$ proportional to an exponent ($i2\theta$) or ($-i2\theta$) for the angle θ of (kx, ky) space is expressed as $A \exp(i(2\theta + \alpha))$ or $A \exp(-i(2\theta + \alpha))$ for a positive real number A and a real number α . Then, stigmata are adjusted so as to minimize the real number A . As a result, a correction

